

2004 Washington Tri State and Regional Variety Trials Economic Analyses – Fresh and Process Markets

Economic Potential

The gross return in U.S. dollars per acre for each Washington trial and entry was calculated using the methods described below. The methods used are similar to those used by the Washington potato industry for determining the market value of fresh and process potatoes. For each trial, a bar graph is used to show the difference in gross return between a traditional potato variety and each trial entry.

Early Process Market Economic Analysis Methods and Assumptions

The gross return in U.S. dollars per acre for each trial entry was calculated using the following early-harvest mock processing contract:

Contract Assumptions:

1. Base price of \$94/ton.
 - a. Base price is an average of early-harvest Ranger Russet contracts from Washington processors based on an August 10, 2004 harvest date.
2. Market Yield (U.S. #1s & 2s) of tubers greater than 4 oz, was multiplied by the base price.
3. Undersized market-grade potatoes less than 4 oz (process culls) were valued at \$40/ton.
4. Specific gravity reject level for Ranger Russet contract = 1.074.
5. No premiums or penalties were applied for tuber fry color, sugar content, internal defects, bruise, or organic production.

Late Process Market Economic Analysis Methods and Assumptions

The gross return in U.S. dollars per acre for each trial entry was calculated using the following late-harvest mock processing contract:

Contract Assumptions:

1. Base price per ton was \$77 for market (U.S. #1 & 2) grade tubers.
2. Premiums for 6 oz and larger market grade tubers of \$0.60/ton for each percentage point greater than 50% they contribute to the total tuber yield composite, up to 70%, with a maximum of \$12.00/ton. Penalties were \$0.60/ton for each percentage point below 50%. Below 48%, penalties were \$1.20/ton with no rejection minimum.
3. Premiums for average tuber specific gravity values above, and penalties for values below, 1.077. Premium per ton was \$3.00 at 1.077, \$5.00 at 1.078, \$6.60 at 1.079, \$8.00 at 1.080, \$9.60 at 1.081, \$11.00 at 1.082, \$12.60 at 1.083, with a maximum of \$14.00 for 1.084 and above. For each 0.001-point decline from 1.077, tuber lots were penalized \$3.00/ton with no rejection minimum.
4. Undersized market grade potatoes less than 4 oz (process culls) were valued at \$40.00/ton.
5. No premiums or penalties were applied for tuber fry color, sugar content, bruise, internal defects, or organic production.

Fresh Market Economic Analysis Methods and Assumptions

The gross return in U.S. dollars per acre for each trial entry was calculated using WA (Columbia Basin) four-year average fresh potato prices. Following discussions with actual pack-sheds and complying with USDA standards, the packaging and size ranges described below provide a good base for variety comparison. A packaging and handling fee (pack-shed operating fee) of \$3.50 was assessed on each CWT of potatoes. Where relative, no premiums were applied for organic production. This economic evaluation does not fully account for consumer preferences for each trial entry. Despite meeting U.S. #1 grade, entries such as Shepody may rate high, but would not be acceptable in the fresh market.

Fresh-pack market 4-year average shipping point prices per tuber size and grade with associated pack-fees.

Markets/Packaging ^a	Grade and Tuber Size Range		Four Year WA State Columbia Basin Average Prices ^c	Pack-Shed Fee: Packaging and Handling	Adjusted Value
	U.S. No. 1 ^b	U.S. No. 2			
<u>50 lb cartons</u>	oz	oz	\$/CWT	\$/CWT	\$/CWT
100 Count	7 to 8.5		\$9.67	\$3.50	\$6.17
90 Count	8.5 to 9.5		\$10.98	\$3.50	\$7.48
80 Count	9.5 to 10.5		\$12.51	\$3.50	\$9.01
70 Count	10.5 to 12.5		\$14.23	\$3.50	\$10.73
60 Count	12.5 to 14		\$14.20	\$3.50	\$10.70
50 Count	14 to 18		\$13.74	\$3.50	\$10.24
<u>10 lb Film Bags</u>					
Non-size A	4 to 7		\$6.72	\$3.50	\$3.22
<u>100 lb Burlap Sacks</u>					
6 oz Min. Size U.S. No. 2		6 to 20	\$5.86	\$3.50	\$2.36
6 oz Min. Size U.S. No. 2	18 to 20		\$5.86	\$3.50	\$2.36
<u>Bulk</u>					
Process-Culls	< 4	< 6	\$2.00	\$3.50	-\$1.50
Process-Culls	> 20	> 20	\$2.00	\$3.50	-\$1.50

^aCount = tuber count per 50 lb carton.

^b18 to 20 oz U.S. No. 1 tubers are typically of marginal value on the fresh market due to their large size. They were therefore priced as U.S. No. 2, 6 oz minimum size.

^cSales F.O.B. Shipping Point, market periods 1997/1998 to 2000/2001 (USDA Federal-State Market News Service 1997-2000). One hundred pound sacks (U.S. No. 2) priced at 50% of carton and non-size A 4-year average value. Process-culls priced at regional process-cull market value.

2004 Early Harvest Tri-State Trial – Washington State

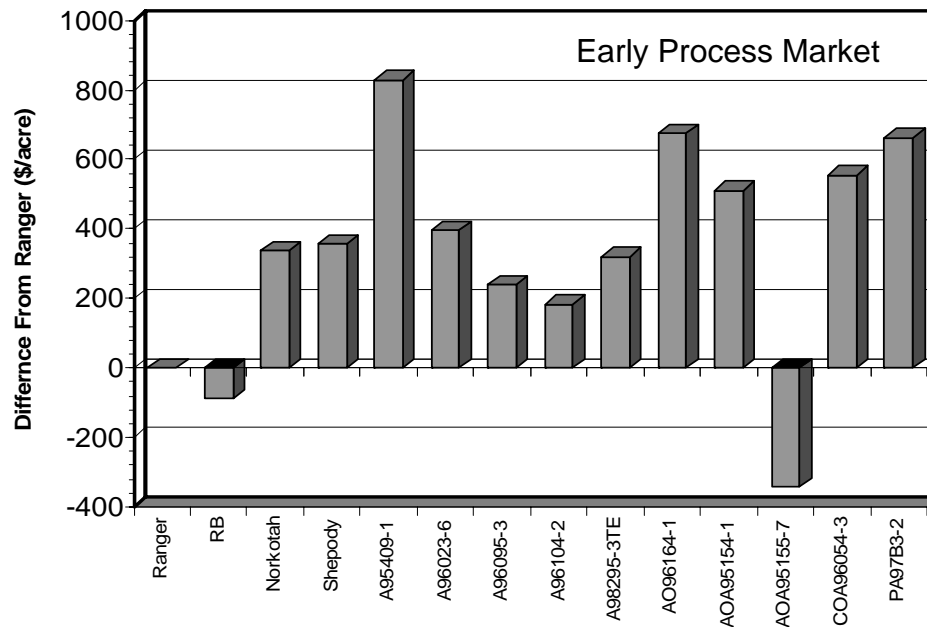


Figure 1. WA TRI-STATE TRIAL 2004, EARLY PROCESS MARKET: Difference in gross return per acre from Ranger Russet calculated by subtracting the gross return of Ranger Russet from the gross return of the particular entry.

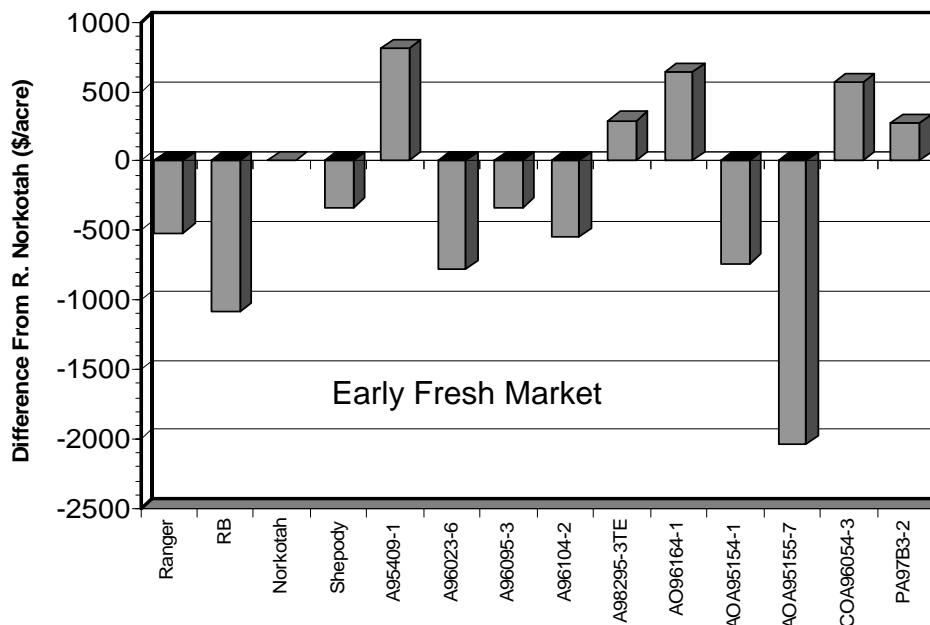


Figure 2. WA TRI-STATE TRIAL 2004, EARLY FRESH MARKET: Difference in gross return per acre from Russet Norkotah calculated by subtracting the gross return of Russet Norkotah from the gross return of the particular entry.

2004 Late Harvest Tri-State Trial – Washington State

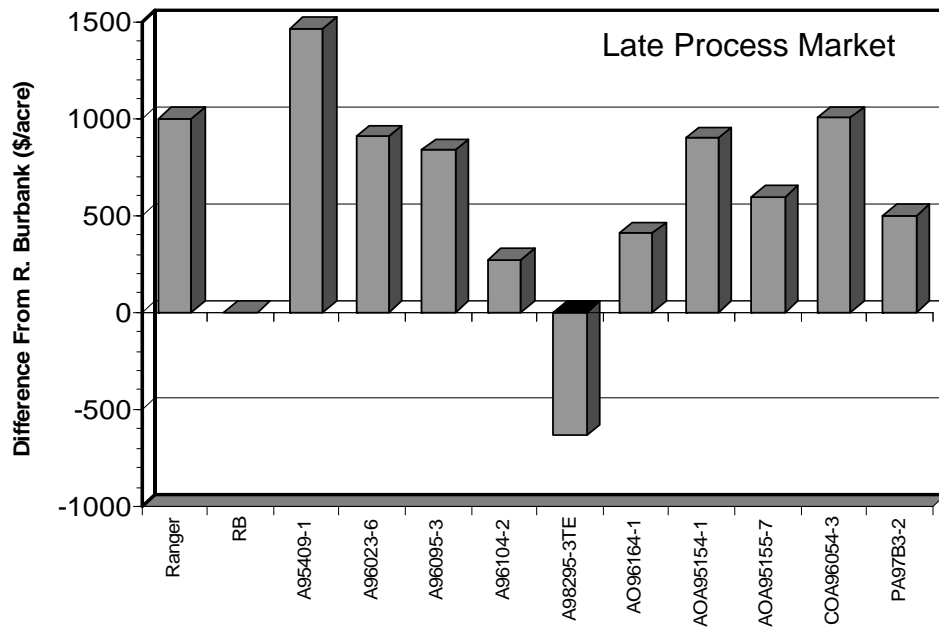


Figure 3. WA LATE TRI-STATE TRIAL 2004, PROCESS MARKET: Difference in gross return per acre from Russet Burbank calculated by subtracting the gross return of Russet Burbank from the gross return of the particular entry.

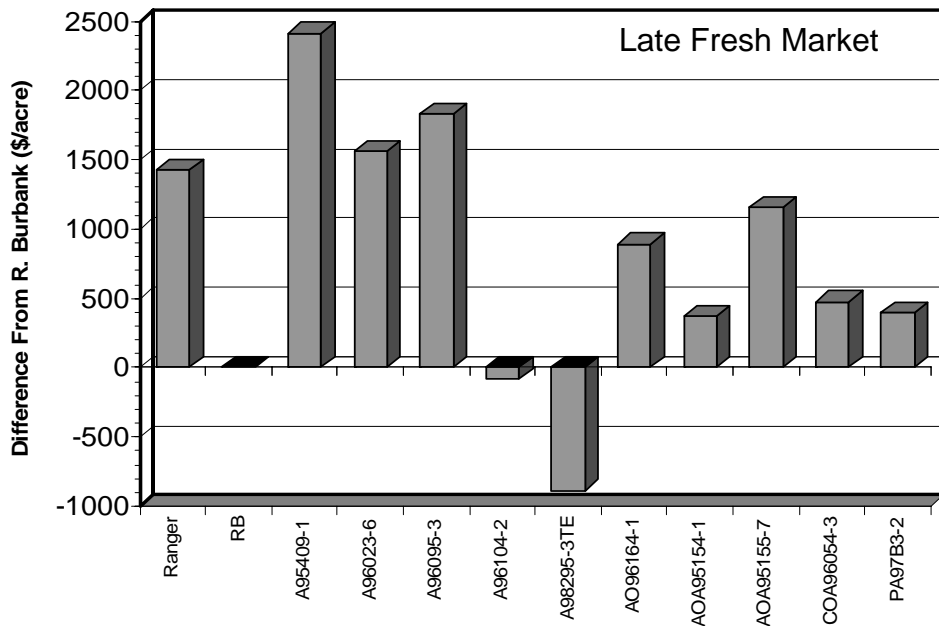


Figure 4. WA LATE TRI-STATE TRIAL 2004, FRESH MARKET: Difference in gross return per acre from Russet Burbank calculated by subtracting the gross return of Russet Burbank from the gross return of the particular entry.

2004 Early Harvest Regional Trial – Washington State

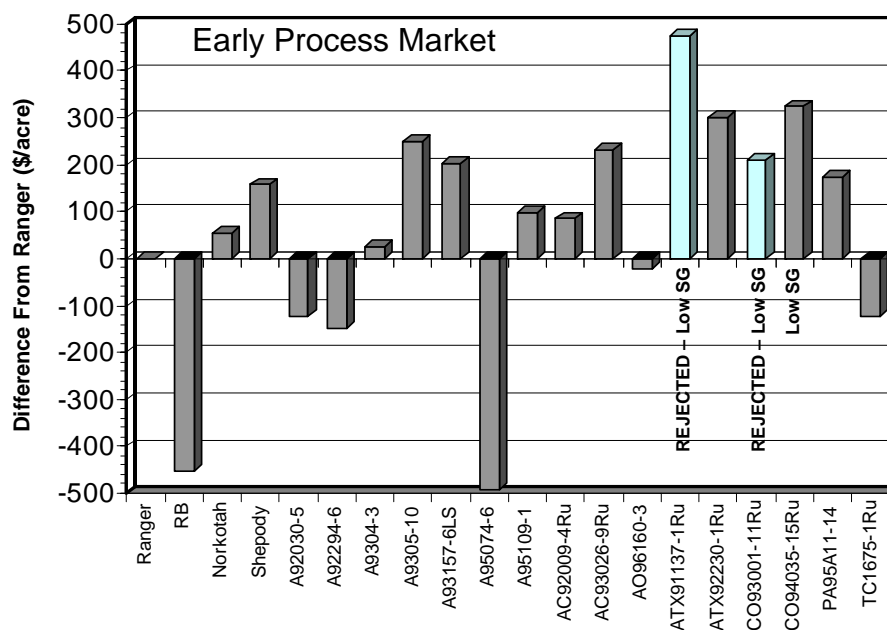


Figure 5. WA EARLY REGIONAL TRIAL 2004, PROCESS MARKET: Difference in gross return per acre from Ranger Russet calculated by subtracting the gross return of Ranger Russet from the gross return of the particular entry. SG = Specific Gravity.

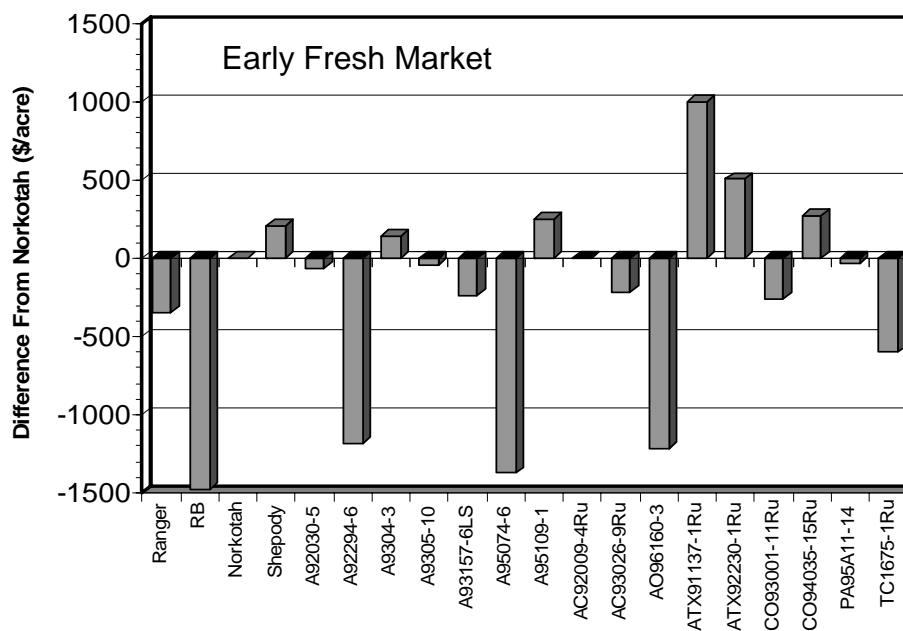


Figure 6. WA EARLY REGIONAL TRIAL 2004, FRESH MARKET: Difference in gross return per acre from Russet Norkotah calculated by subtracting the gross return of Russet Norkotah from the gross return of the particular entry.

2004 Late Harvest Regional Trial – Washington State

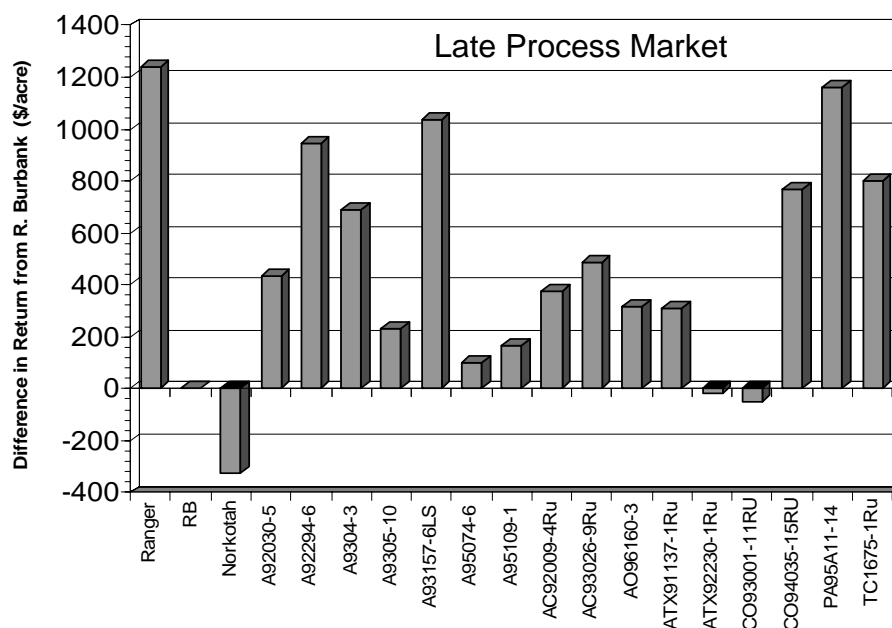


Figure 7. WA LATE REGIONAL TRIAL 2004, PROCESS MARKET: Difference in gross return per acre from Russet Burbank calculated by subtracting the gross return of Russet Burbank from the gross return of the particular entry.

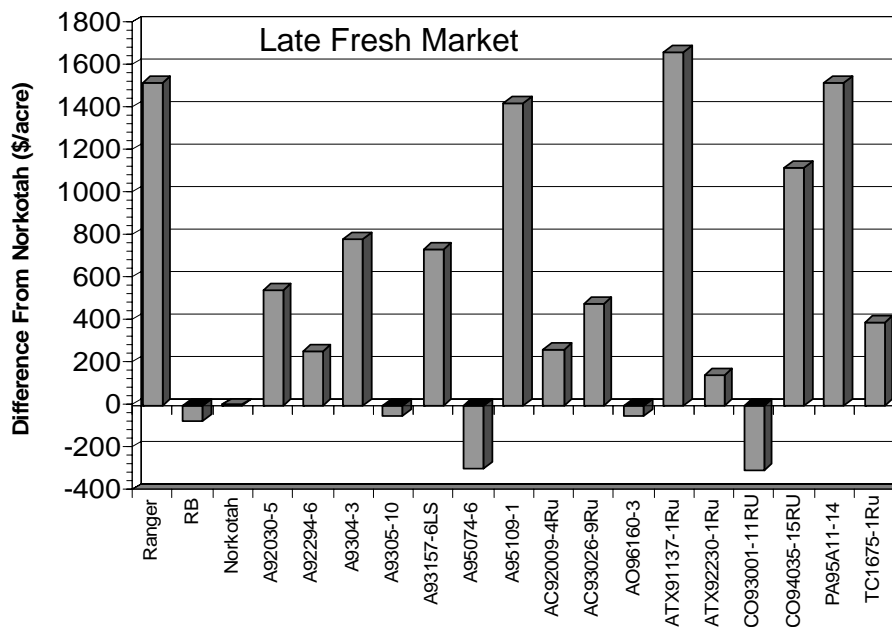


Figure 8. WA LATE REGIONAL TRIAL 2004, FRESH MARKET: Difference in gross return per acre from Norkotah calculated by subtracting the gross return of Norkotah from the gross return of the particular entry.

2004 Organic Late Harvest Regional Trial – Washington State

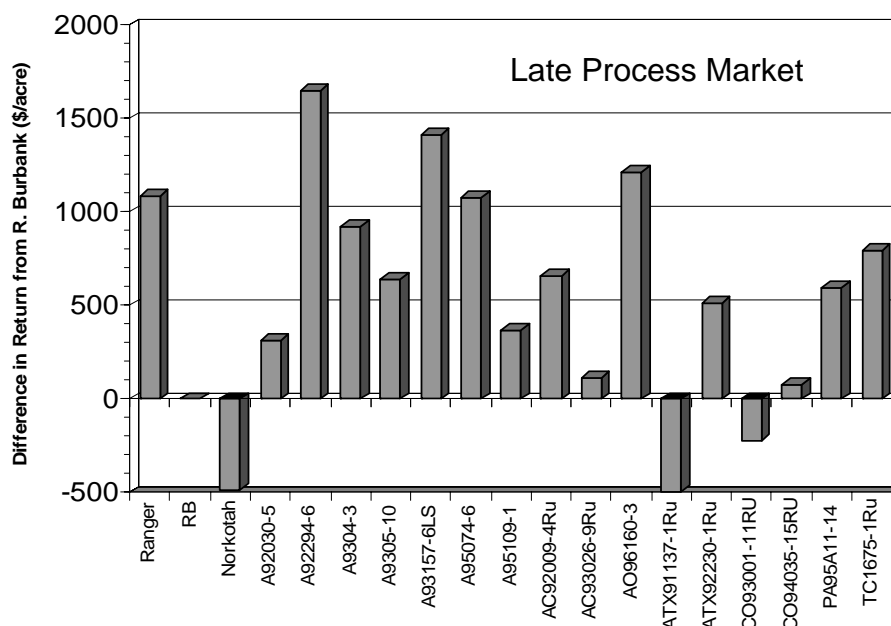


Figure 9. WA ORGANIC LATE REGIONAL TRIAL 2004, PROCESS MARKET: Difference in gross return per acre from Russet Burbank calculated by subtracting the gross return of Russet Burbank from the gross return of the particular entry.

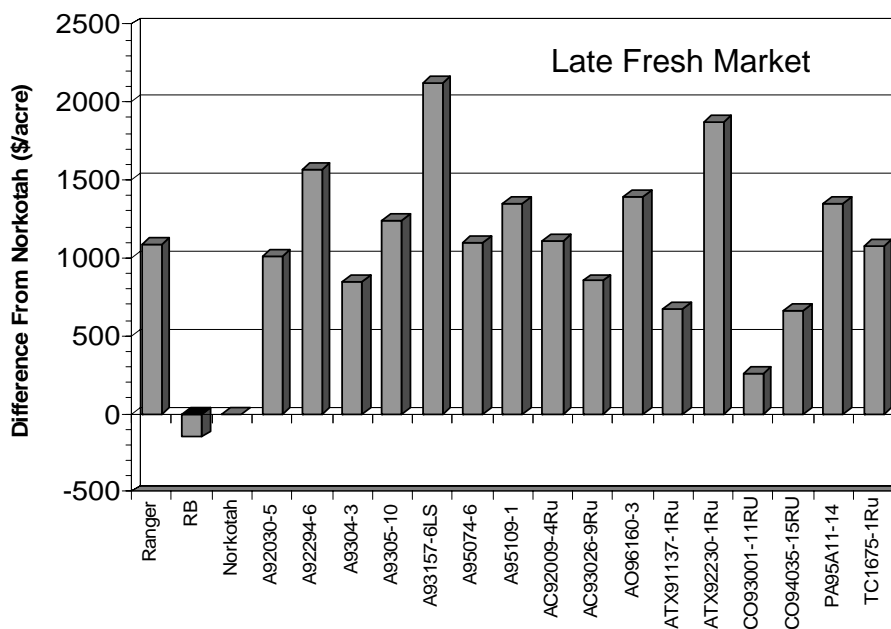


Figure 10. WA ORGANIC LATE REGIONAL TRIAL 2004, FRESH MARKET: Difference in gross return per acre from Norkotah calculated by subtracting the gross return of Norkotah from the gross return of the particular entry.

Additional 2004 Information: WA Organic Late Regional Trial In-Field Results

ENTRY	U.S. #1 YIELD (CWT/A) (Tuber Size in Ounces)					U.S. #1 YIELD > 4 oz			TOTAL YIELD (U.S. #1 & #2's + Culls)	
	4-6	6-10	10-12	12-14	>14	CWT/A*	Tons/A	% of Total Yield	CWT/A*	Tons/A
Ranger Russet	71	130	53	37	63	355	DEF	17.7	539	BCDEF
Russet Burbank	82	90	25	16	28	240	GH	12.0	482	DEFGH
Russet Norkotah	58	106	27	20	18	229	H	11.4	353	I
A92030-5	33	95	51	37	116	332	EF	16.6	428	GHI
A92294-6	112	205	41	55	54	467	AB	23.3	708	A
A9304-3	34	81	41	34	144	334	EF	16.7	547	BCDE
A9305-10	72	111	53	48	135	419	ABCD	21.0	550	BCDE
A93157-6LS	38	115	80	75	186	494	A	24.7	588	BC
A95074-6	92	156	48	30	68	393	BCDE	19.7	538	BCDEF
A95109-1	70	166	50	46	87	418	ABCD	20.9	507	CDEFG
AC92009-4Ru	73	119	66	37	77	372	CDEF	18.6	459	EFGH
AC93026-9Ru	49	97	46	47	70	309	FG	15.4	420	GHI
AO96160-3	135	207	54	23	47	466	AB	23.3	612	B
ATX91137-1Ru	94	161	35	29	32	352	DEF	17.6	446	FGH
ATX92230-1Ru	54	120	56	63	175	467	AB	23.3	570	BCD
CO93001-11RU	119	135	34	9	23	320	EF	16.0	464	EFGH
CO94035-15RU	40	86	54	38	85	303	FGH	15.1	400	HI
PA95A11-14	103	201	63	40	34	440	ABC	22.0	596	BC
TC1675-1Ru	98	158	54	33	45	387	CDE	19.4	505	CDEFG

* Numbers followed by the same letter are not significantly different at the 5% level using Fisher's Protected LSD Test.

ENTRY	UNDERSIZE (< 4 oz) CWT/A	YIELD U.S. #2's AND CULLS		CARTON YIELD (100 to 60 Count) (7-14oz U.S. #1's)		EXTERNAL DEFECTS (%)				AVERAGE TUBER NUMBER	AVERAGE TUBER SIZE
		CWT/A	Tons/A	CWT/A	% of Total Yield	Knobs	Malformed	Growth Cracks	Green	(Tubers/Plant)	(Ounces)
Ranger Russet	41	142	7.1	118	21.9	0.0	1.1	1.1	0.7	7.8	7.0
Russet Burbank	88	154	7.7	98	20.3	5.1	8.3	0.0	0.7	9.0	5.3
Russet Norkotah	41	83	4.1	117	33.3	0.0	5.3	0.0	1.8	5.7	6.2
A92030-5	27	69	3.5	169	39.4	0.0	1.1	0.5	2.6	4.8	8.8
A92294-6	88	152	7.6	250	35.3	0.1	4.3	0.5	3.3	11.0	6.3
A9304-3	31	181	9.1	135	24.6	2.6	0.4	0.0	1.0	5.5	9.4
A9305-10	45	85	4.3	179	32.6	0.4	1.2	0.5	2.3	7.2	7.5
A93157-6LS	28	67	3.3	250	42.4	0.9	0.6	0.3	1.7	6.9	9.2
A95074-6	67	77	3.9	195	36.2	0.0	0.0	0.0	4.4	8.7	6.5
A95109-1	50	39	2.0	221	43.5	0.0	0.0	0.0	0.6	8.1	7.3
AC92009-4Ru	45	42	2.1	193	42.0	0.0	1.1	0.0	1.7	6.6	7.1
AC93026-9Ru	42	69	3.5	168	40.0	2.3	1.0	0.4	5.8	5.8	7.2
AO96160-3	74	71	3.6	222	36.4	0.0	0.4	0.0	0.4	10.0	6.1
ATX91137-1Ru	59	35	1.8	173	38.9	0.0	1.6	0.0	1.2	7.5	6.1
ATX92230-1Ru	36	67	3.3	205	36.0	0.0	0.0	0.3	2.4	7.8	8.5
CO93001-11RU	98	44	2.2	136	29.3	0.0	0.0	0.0	2.0	9.3	5.1
CO94035-15RU	36	61	3.1	159	39.7	0.0	2.1	0.3	2.9	5.2	7.9
PA95A11-14	104	53	2.6	248	41.6	0.4	0.3	1.0	1.9	10.4	5.5
TC1675-1Ru	67	51	2.5	197	39.0	0.0	0.0	0.0	0.4	8.0	6.2

ENTRY	SPECIFIC GRAVITY	INTERNAL DEFECTS (%)			BRUISE RATING		30 DAY STAND	40 DAY STAND	60 DAY STAND	60 DAY STEMS
		Sample on 8-12 oz tubers	% HH	% BC	% IBS	BLACKSPOT	SHATTER	(% Emerged)	(% Emerged)	(Stems/plant)
Ranger Russet	1.081	0	0	0	26%	37%	72	91	94	1.8
Russet Burbank	1.072	0	0	0	15%	82%	73	80	94	2.0
Russet Norkotah	1.064	0	0	0	10%	36%	47	68	76	2.3
A92030-5	1.075	0	0	0	30%	49%	54	79	77	1.5
A92294-6	1.084	0	0	0	19%	61%	77	89	90	3.1
A9304-3	1.077	0	0	0	21%	59%	38	88	89	2.1
A9305-10	1.073	0	0	0	9%	86%	67	88	90	2.2
A93157-6LS	1.083	0	0	0	26%	87%	34	76	85	2.1
A95074-6	1.087	0	0	0	18%	78%	66	78	83	2.0
A95109-1	1.070	0	0	0	16%	76%	43	86	85	2.2
AC92009-4Ru	1.080	0	0	3	38%	65%	22	84	92	1.4
AC93026-9Ru	1.073	5	0	0	18%	85%	15	63	78	1.5
AO96160-3	1.077	0	0	3	35%	48%	50	88	90	1.9
ATX91137-1Ru	1.060	0	0	0	8%	54%	66	83	84	1.9
ATX92230-1Ru	1.069	0	0	0	8%	86%	56	71	79	1.8
CO93001-11RU	1.065	0	0	3	10%	30%	70	92	90	2.9
CO94035-15RU	1.073	0	0	0	9%	64%	61	81	83	2.0
PA95A11-14	1.071	0	0	0	15%	78%	54	79	88	2.3
TC1675-1Ru	1.078	5	0	0	31%	18%	59	84	89	2.3